

ISOLATED FULL DUPLEX RS232C INTERFACE

M Asim Khan, asimkhan@sat.net.pk

This self powered interface circuit electrically isolates the TxD and RxD lines from the PC serial port and protect the PC from direct connection to hazardous voltages.

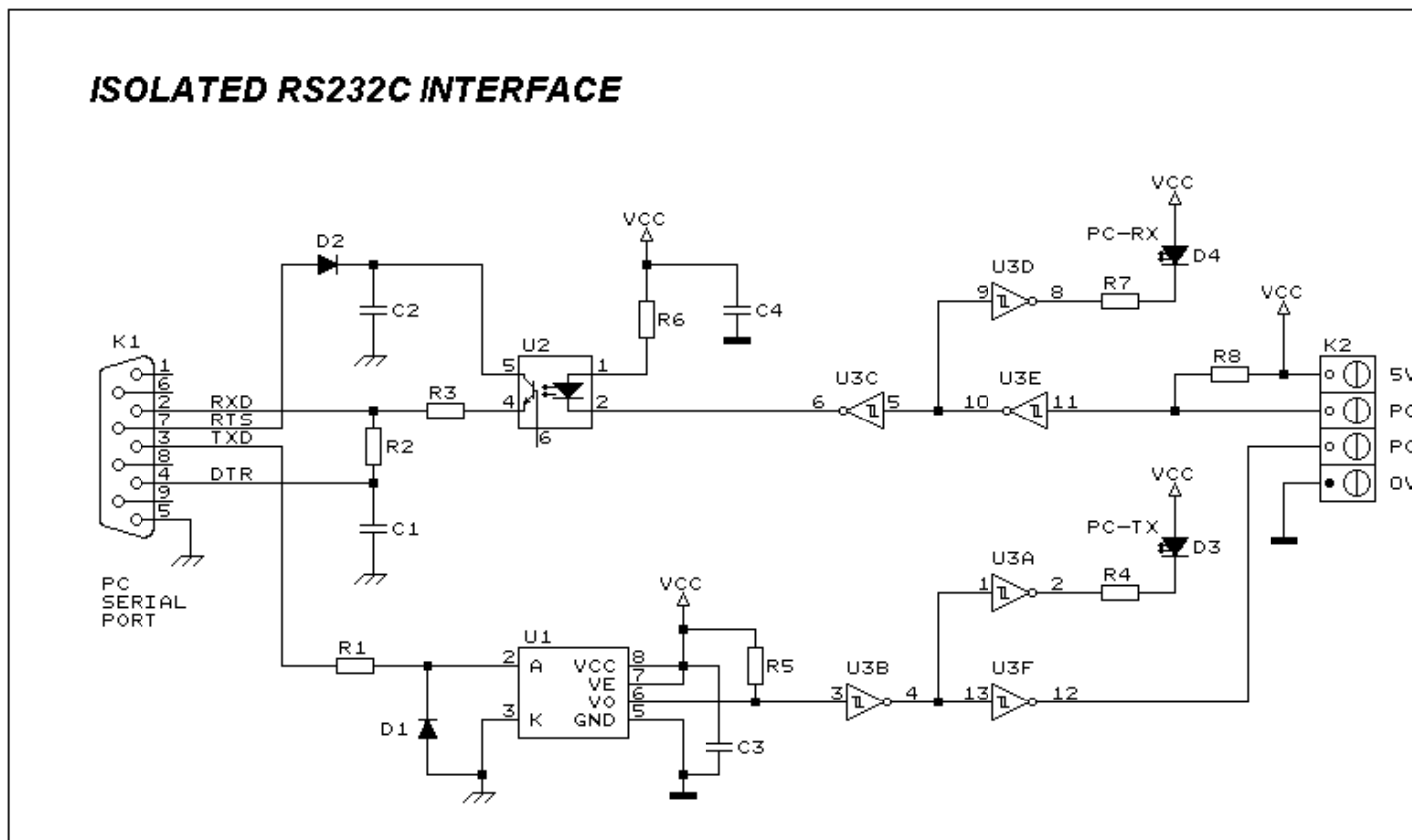


Figure 1: Circuit Diagram of Isolated RS232C Interface

The isolator is intended to provide electrical isolation between a computer and the equipment connected to its serial port. This can be necessary when the target system works at a completely different voltage level, or when earth loops must be avoided.

Figure 1 shows how the electrical isolation is achieved. Connector K1 is linked to the serial port of the PC, power to the PC side of the circuit is derived from the signal lines DTR and RTS. Positive supply is derived from RTS and -ve one from the DTR line, therefore it is necessary for the user program to set the RTS status to logic zero & DTR to logic one in order to get the proper supply levels at the output. IC U1 is used to isolate the TxD line while IC U2 isolates the RxD line.

The other side of the isolator carries TTL levels. This side is powered by the target system power supply. IC U3 is used to buffered the signals for the opto isolators and also drives the data indicating LEDs. The interface has been tested at the baud rate of 19.2k baud.

Figure 2 & 3 shows the component layout of the isolator pcb and the track patterns respectively.

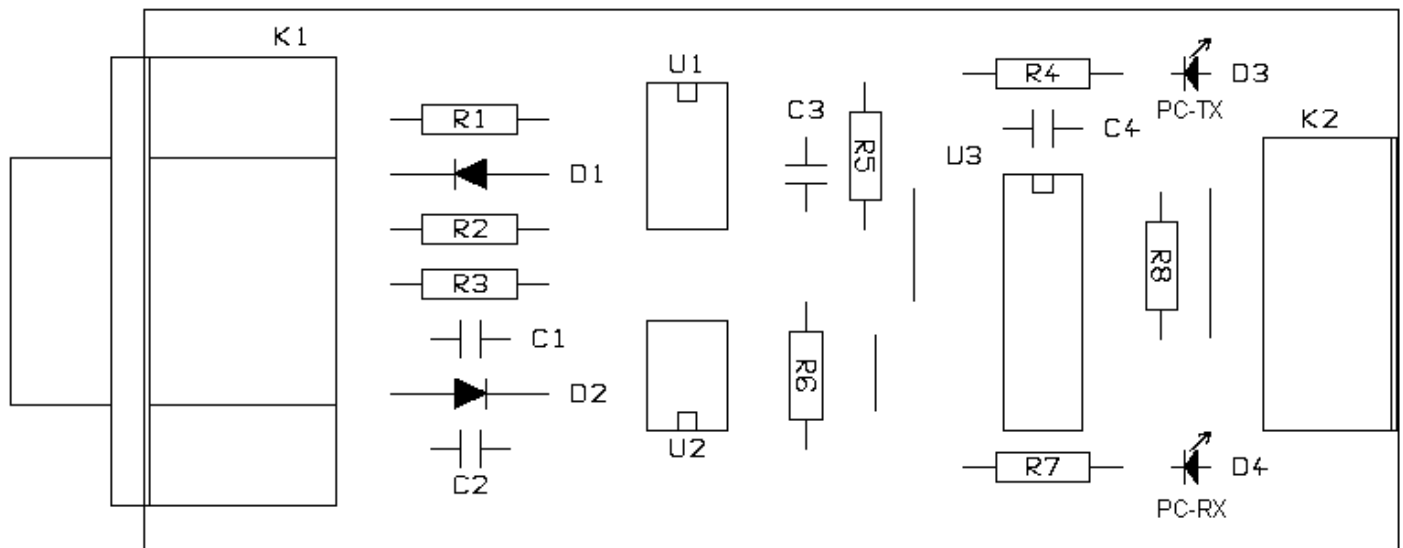


Figure 2: Component layout of the Isolator PCB

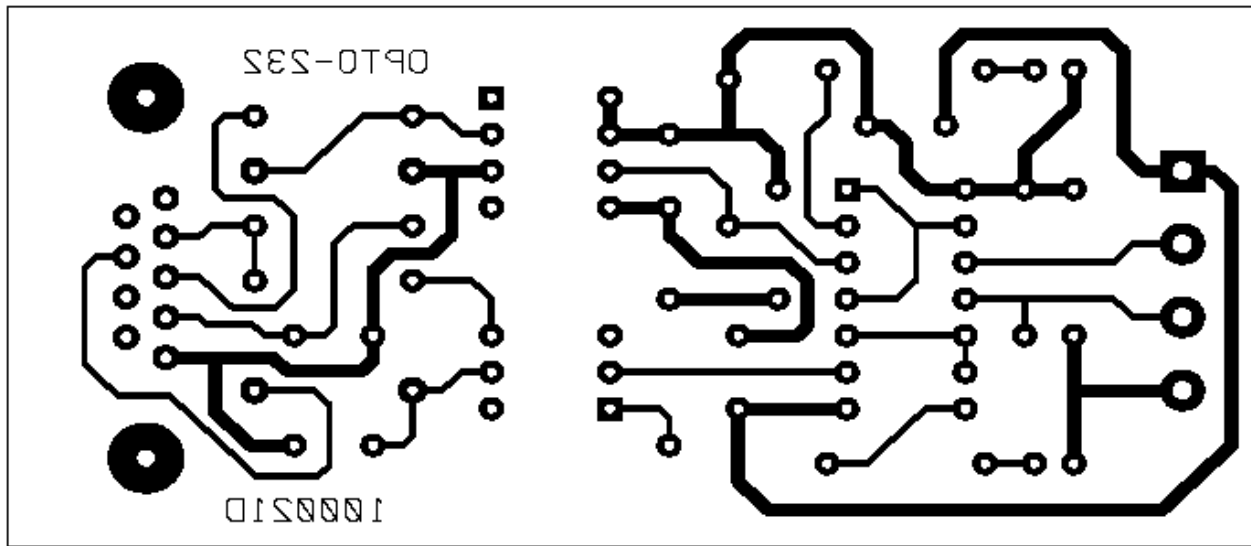


Figure 3: Track patterns of the Isolator PCB

Components detail of the project.

1	2	C2,C1	470nF
2	2	C3,C4	100nF
3	2	D2,D1	1N4148
4	2	D4,D3	LED RED 3mm
5	1	K1	DB9 R/A PCB TYPE PLUG
6	1	K2	PCB TERMINAL BLOCK 4 WAY
7	1	R1	1K
8	1	R2	1K5
9	1	R3	100R
10	2	R4,R7	680R
11	2	R5,R8	4K7

12	1	R6	270R
13	1	U1	6N137
14	1	U2	CNY17-3, 4N37
15	1	U3	74HC14

Build Your Own
μControllers Projects

21 Oct 2000